

REMARKS

Applicant thanks the Examiner for the careful review of this application. Applicant has canceled claims 1-17. Applicant reserves the right to introduce claims of similar scope in a future application. Applicant has amended claims 18, 19, 21, 22, 23, 27-32 to better clarify the scope of the invention. Applicant has added new claims 33-37. No new matter has been added. Claims 18-37 remain pending in the application.

OBJECTIONS TO THE SPECIFICATION

Examiner has objected to the abstract of the disclosure because of the inclusion of legal phraseology such as "comprising" and "consisting of". Applicant has amended the abstract to remove the legal phraseology.

REJECTIONS UNDER 35 U.S.C. § 112

Examiner has rejected claims 13-16 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention. Applicant has canceled the claims 13-16.

REJECTIONS UNDER 35 U.S.C. § 103

Examiner has rejected Claims 1-32 under 35 USC §103(a), as being unpatentable over either Huang et al (US Patent No. 5,683,957) or Gruening (US Patent No. 4,977,186) in view of Shepherd (US Patent No. 3,876,761).

The Prior Art

Huang et al discloses an inexpensive composition effective for forming a long lasting, erosion controlling, germination promoting, pliable film over bare soil. The composition may be formulated in dry or liquid form and applied as either a dry powder or liquid dispersion. The composition includes at least a major proportion of gelatinized starch and a plasticizer.

The composition may further include a fungicide, a bactericide, a micronutrient, and a filler. The liquid form will also include sufficient solvent--typically water--and may further include a thickener and an emulsifier for purposes of controlling settling of the components and maintaining a uniform dispersion.

Gruening discloses a composition for preserving wood or composite wood materials and for treating soil containing a compound selected from the group consisting of 3-iodo-2-propynyl-butyl carbamate, 3-iodo-2-propynyl hexyl carbamate, 3-iodo-2-propynyl cyclohexyl carbamate, 3-iodo-2-propynyl phenyl carbamate, and mixtures thereof, and at least one pyrethroid-type insecticide selected from the group consisting of cyano-(4-fluoro-3-phenoxyphenyl)-methyl-3-(2,2-dichloroethyl)-2,2-dimethyl-cyclopropanecarboxylate, 3-phenoxyphenyl)-methyl-3-(2,2-dichloroethenyl)-2,2-dimethyl-cyclo-propanecarboxylate, cyano-(3-phenoxyphenyl)-methyl-3-(2,2-dichloroethenyl)-2,2-dimethyl-cyclopropancarboxylate, cyano-(3-phenoxyphenyl)-methyl-2-(4-chlorophenyl)-3-methylbutyrate, and mixtures thereof.

Shepherd discloses a gel made of a liquid soil fumigant and a polymer having the proper hydrophilic-hydrophobic balance of having the proper crystalline non-crystalline mixture.

The Prior Art Distinguished

With respect to claims 1-17, the examiner's arguments are moot. The claims have been canceled and are no longer pending in the application.

With respect to independent claim 18, the applicant respectfully disagrees with the examiner's statement "Both Huang et al., and Gruening teach the known and expected combination of a soil biocide and an emulsifier..." Gruening teaches the combination of an emulsifier with an insecticide and a fungicide (col. 2, lines 60-68; col. 3, lines 1-25). The insecticide disclosed in Gruening is generally a pyrethroid type insecticide primarily useful for the control of termites (col. 1 lines 55-58). The fungicide disclosed in Gruening is a carbamate compound such as IPBC that is effective for wood destroying fungi but has low toxicity for common fungi (col. 1, lines 41-42). There are a number of important distinctions between the fumigant soil biocides (methyl bromide, chloropicrin, 1,3 dichloropropene, and

methylisothiocyanate) and fungicide/ insecticide combination disclosed in Gruening. Firstly, the combination of the fungicide and insecticide cannot be considered a soil biocide. A biocide, as defined by Merriam Webster, is “a substance destructive to *many different organisms*”. As cited above, the insecticide component is specific to termites and the fungicide is specific to wood destroying fungi. This combination does not have the broad based killing capability to be an effective soil biocide, which must kill a wide variety of insects, weeds, nematodes, bacteria, and fungi. Secondly, the compounds cited in Gruening are designed for long term residency in the soil. Gruening states “It generally is agreed that insecticides for plant protection should degrade after a certain period of time to eliminate the possibility of food chain contamination endangering the health of humans and wildlife... These characteristics are the antithesis of properties needed for a successful wood or soil treatment composition, where long-term efficacy and good penetration of the active ingredients into the woody substrate or soil stratum are key attributes” (col. 1, lines 59-62, col. 2, lines 1-4). In contrast, the soil biocides cited in the applicant’s claim 18 (methyl bromide, chloropicrin, 1-3 dichloropropene, and methylisothiocyanate) are fumigants and are designed for relatively short residence time in the soil, on the order of a few weeks (applicant’s specification, page 2, lines 19-20). Thirdly, the chemical properties are vastly different between the insecticide/fungicide disclosed in Gruening and the soil biocides disclosed in the applicant’s claim 18. The compounds disclosed in Gruening are higher molecular weight (or are solvated in a low volatility, higher molecular weight oil – col. 4, lines 36-46) and are considerably less volatile. The compounds cited in the applicant’s claim 18, are by contrast very volatile compounds, and are generally applied to soils as vapors or gasses, or as liquids that vaporize to gasses in situ. It is unlikely, therefore, that one of ordinary skill in the art would utilize an emulsifier, as disclosed in Gruening, to solvate the fumigants disclosed in the applicant’s claim. There is no suggestion, or teaching, in Gruening to indicate that an emulsifier would function to produce an effective soil biocide with any one of the compounds methyl bromide, chloropicrin, 1-3 dichloropropene, and methylisothiocyanate. Therefore, the applicant respectfully contends that there is no motivation to combine Gruening with Shepherd, and that the examiner has failed to establish a *prima facie* case of obviousness with respect to these references.

Huang et al. also fails to disclose a soil biocide as suggested by the examiner. Huang et al. discloses an emulsifier, that when combined with a thickener, is used for the purposes of

controlling settling of oil in water dispersions (Abstract and col. 5 lines 7-10, col. 4 lines 43-45). There is no suggestion, or teaching, in Huang et al. to indicate that an emulsifier would function to produce an effective soil biocide with any one of the compounds methyl bromide, chloropicrin, 1-3 dichloropropene, and methylisothiocyanate recited in claim 18. The applicant respectfully contends that there is no motivation to combine Huang et al. with Shepherd, and that the examiner has failed to establish a *prima facie* case of obviousness with respect to these references.

Applicant therefore asserts that claim 18 is allowable over the prior art. Since claims 19-31 and 34 are proper dependent claims directly or indirectly reporting to claim 18, they are also allowable.

With respect to claim 32 as amended, neither Gruening, Huang et al., or Shepherd, alone or in combination, teach all of the elements. Specifically, none of the cited references, alone or in combination, teach a method for fumigating soil, said method comprising the steps of:

creating a biocide formulation containing
an anionic surfactant,
a non-ionic surfactant, and
an effective amount of a soil biocide selected from the group consisting of methyl bromide, chloropicrin, 1-3 dichloropropene, and methylisothiocyanate;
creating a soil treatment mixture by adding said biocide formulation to an aqueous medium; and,
applying said soil treatment mixture to the soil in a drip irrigation system.

Applicant therefore asserts that claim 32, as amended, is patentable over the prior art. Claim 33 is a proper dependent claim reporting to claim 32 and is therefore also patentable.

With respect to claim 35, neither Gruening, Huang et al., or Shepherd, alone or in combination, teach all of the elements. Specifically, none of the cited references, alone or in combination, teach a method for applying a soil biocide formulation to soil comprising:

creating a biocide formulation including
an anionic surfactant,
a non-ionic surfactant, and

an effective amount of a soil biocide selected from the group consisting of methyl bromide, chloropicrin, 1-3 dichloropropene, and methylisothiocyanate;

creating a soil treatment mixture by adding said biocide formulation to an aqueous medium; and

applying said soil treatment mixture to the soil.

Applicant asserts that claim 35 is patentable over the prior art, and is allowable. Since claims 36 and 37 are proper dependent claims reporting to claim 35, they are also allowable.

CONCLUSION

Applicant believes that all pending claims, as amended, are clearly allowable over the known prior art and respectfully requests a Notice of Allowance for this application from the Examiner.

If the Examiner believes that a conference would be of value in expediting the prosecution of this application, he is cordially invited to telephone the undersigned counsel to arrange for such a conference.

Respectfully submitted,

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Date: April 7, 2004

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